vertical distance from line 10 to the level of each integer. These ordinates are given in Table II. below.

Another element of distortion, though very slight, was found in the assumption of equal spacing for the horizontal intervals between successive points in the plot. The spaces *ought* to vary somewhat according to the levels of pitch. It was, however, some time before it became clear that the single measurement determined the position of the point on *both* coordinates—on the vertical one as pitch, and on the horizontal one as time-elapsed between successive wave-crests in the record.

So amended, the scheme seems perfect. Nevertheless a suggestion or two may save much time and trouble to one who may have occasion to use it.

It is neither necessary nor desirable to measure separately every wave-length of the record. It is quite as well to measure them in groups of five together and take the average for plotting, if only one measure separately the very first wave and the last, so as to make sure of the pitch at those points. Similarly the intervals for the horizontal spacing need not be the very ones indicated by the measured numbers, but rather some constant fraction of them, such as will better bring out the features of the curve.

All the numbers concerned in the scheme are merely ratios setting forth the relationships between the various elements of it within the compass of two octaves of pitch, which is quite sufficient to cover the range of any voice in ordinary speech. The scheme may therefore be used just as it stands if the measurements do not exceed its limits. If they do, the whole system may be raised an octave by the simple device of dividing the integral numbers throughout by 2, or lowered an octave by multiplying them by 2. Or it may be raised a fourth by multiplying them by 0.7, or lowered a fourth by multiplying them by 1.5—taking pains however in these last cases to shift the semitone letters correspondingly.

Since the semitone intervals are all equal, the C which represents concert pitch may be placed anywhere in the field where its measured wave-length indicates. All the other semitone letters then will take their places at the same constant distances as in the scheme described.

TABLE I

Ratios of the Tempered Scale

C	10
B	10.60
A♯	11.23
A	11.89
G♯	12.60
G	13.35
F♯	14.14
F	14.98
E	15.87
D♯	16.81
D	17.81
C♯	18.87
C	20

TABLE II

Ordinates of the Number Series

Number	Distance	Number	Distance
10	000	26	16.54
11	165	27	17.19
12	316	28	17.82
13	454	29	18.43
14	582	30	19.02
15	702	31	19.58
16	814	32	20.14
17	918	33	20.67
18	1,017	34	21.19
19	1,111	35	21.69
20	1,200	36	22.17
21	1,284	37	22.65
22	1,365	38	23.11
23	1,442	39	23.56
24	1,515	40	24.00
25	1,586		

CORNELIUS BEACH BRADLEY
UNIVERSITY OF CALIFORNIA

SOCIETIES AND ACADEMIES

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 557th regular meeting of the society was held in the Assembly Hall of the Cosmos Club, Saturday, May 20, 1916, called to order by President Hay at 8 P.M., with 30 persons present.

On recommendation of the council, James L. Peters was elected to active membership.

The president announced that the council of the society had voted to adopt the custom of medical societies and of many other scientific societies limiting the members to speak but once during the

discussion of papers and of asking the original speaker to answer all questions at the end of the discussion and to close the same.

Under the heading of brief notes and exhibition of specimens, Dr. Howard E. Ames referred again to the dorsally placed mammæ of the coypu (*Myocastor coypu*) and exhibited photographs of a female coypu in the collection of the Philadelphia Zoological Society showing the mammæ so placed.

The first paper of the regular program was by A. T. Speare, "Some Fungi that Kill Insects." Mr. Speare spoke briefly of certain experiments that were conducted in Europe about 1885, in which place the "green muscardine" fungus was used in a practical way to combat the cockchafer of wheat. Reference was also made to similar work that has recently been conducted in Florida and Trinidad, B. W. I. The writer spoke also of the present status of the chinch-bug disease and of the brown-tailed moth disease. In regard to the latter he spoke in detail of the methods employed in spreading this disease in the field. At the end of the paper he exhibited lantern slides illustrating various types of entomogenous fungi, some of which were collected by him in the Hawaiian Islands. Mr. Speare's communication was discussed by General Wilcox and by Dr. Howard.

The second paper was by L. O. Howard: "The Possible Use of *Lachnosterna* Larvæ as a Food Supply." Dr. Howard briefly referred to the prejudice against insects as food, and gave an account of his experiments recently undertaken with white grubs sent in from Wisconsin. They were sterilized, thoroughly washed, the contents of the alimentary canal removed, and were then served as a salad and in a broth. They were eaten by several members of the Bureau of Entomology and by Mr. Vernon Bailey of the Bureau of the Biological Survey and were pronounced distinctly edible. The speaker urged further experimentation with abundant species of insects as to their food value. Dr. Howard's communication was discussed by the chair, Mr. W. E. Safford, General Wilcox and Medical Inspector Ames.

The last paper was by W. E. Safford: "Agriculture in Pre-Columbian America." Mr. Safford described the various plants used by the early inhabitants of America, particularly those of Mexico, Central and South America, the manner of their use and preparation, and called attention to those employed at the present day and which have been adopted by civilized man. The prominent part which these plants played in the life of the pre-Columbian inhabitants is shown in ceremonial objects, earthenware products, etc., ornamented by designs based on these plants and in some cases by molds of parts of plants. Mr. Safford's communication was illustrated by numerous lantern-slide views of the plants under consideration and of many objects bearing plant designs. It was discussed by the chair, General Wilcox and Professor E. O. Wooton.

M. W. Lyon, Jr.,
Recording Secretary

ANTHROPOLOGICAL SOCIETY OF WASHINGTON

At the 499th regular and 37th annual meeting of the Anthropological Society of Washington, on April 18, Dr. John R. Swanton, president of the society, read a paper on "The Influence of Inheritance on Human Culture."

The speaker distinguished between the physical and mental traits which one inherits in his own person, and the store of ideas and things which have been passed down to him by previous generations. The environment into which one is born is of two kinds, the environment unaffected by man, and the environment as modified by man; and the advancement of a tribe depends on the amount of environment it is able to grasp and transmit. In this way a mental and material capital is laid up which enables further progress to be taken much more easily. Nevertheless, all of this world capital is not good, since false ideas and injurious institutions may be transmitted as well as true principles and beneficent institutions. One of the most pernicious of these institutions is that which permits monopolization of ideas and things by limited classes. A general diffusion of knowledge and improvement of the means of distributing it has largely destroyed monopoly in ideas, but monopoly in property still persists. The cure for this condition is to be found, the speaker believed, either in binding together use and ownership in such a manner that they can not be separated, or in vesting ownership in an immortal body such as the state and allowing use to individuals during their lives.

The following officers were elected for the ensuing year: President, Dr. John R. Swanton (reelected); Vice-president, Mr. William H. Babcock; Secretary, Miss Frances Densmore; Treasurer, Mr. J. N. B. Hewitt (reelected); Councillors, Dr. Truman Michelson, Mr. Neil M. Judd, Mr. Francis La Flesche, Dr. C. L. G. Anderson, and Dr. Edwin L. Morgan.

Frances Densmore,
Secretary